

San Joaquin Valley Unified Air Pollution Control District

PERMIT UNIT: S-172-1-7

EXPIRATION DATE: 4/30/2000

EQUIPMENT DESCRIPTION:

NOMINALLY RATED 48 MW G.T.E. COGENERATION SYSTEM WITH SCR INCLUDING STEWART & STEVENSON GE LM-5000 GAS TURBINE GENERATOR, HEAT RECOVERY STEAM GENERATOR, AND INLET AIR ABSORPTION CHILLER AND HEAT EXCHANGER

Permit Unit Requirements

1. For control of all gas turbine exhaust, the gas-fired turbine shall be equipped with combustor steam injection and a selective catalytic reduction (SCR) control systems utilizing ammonia as reducing agent for NOx controls [District NSR Rule] Federally Enforceable Through Title V Permit
2. Gas-fired turbine shall be equipped with carbon monoxide (CO) reactor of sufficient catalyst volume to meet CO and VOC emissions limits [District NSR Rule] Federally Enforceable Through Title V Permit
3. Gas turbine steam injection rate shall be maintained at a steam to fuel ratio which results in compliance with emission limits, except during periods of startup, shutdown and malfunction as defined in this permit. Only malfunctions as defined in 40 CFR Part 60 qualify for this exemption. [40 CFR Part 60, Subpart A] Federally Enforceable Through Title V Permit
4. Gas turbine combustor steam injection shall be equipped with continuously recording steam and fuel injection rate monitoring system, accurate within <5% allowing calculation of water/steam to fuel injection ratio [District NSR Rule; District Rule 4703, 6.2.1; and 40 CFR 60.334(a)] Federally Enforceable Through Title V Permit
5. The gas turbine shall be fired exclusively on PUC regulated natural gas. The natural gas must have a sulfur content of less than or equal to 0.017% by weight [District Rule 4801; CFR 60.333(a) & (b).; 60.332(a); Kern County Rule 407] Federally Enforceable Through Title V Permit
6. Startup and shutdown of gas turbine, as defined in this permit and in 40 CFR Subpart A 60.2, shall not exceed a time period of three hours and one hour, respectively, per occurrence. Emission concentrations subsequent to this startup period shall not exceed the limits specified in this permit except during shutdown. [District NSR Rule] Federally Enforceable Through Title V Permit
7. Operations during periods of startup and shutdown shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the emission limit shown in this permit during periods of startup and shutdown be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard [40 CFR 60.8(c)]. Federally Enforceable Through Title V Permit
8. The maximum VOC emission concentration at turbine exhaust shall not exceed 0.6 ppmv dry at 15% O₂, except during periods of startup and shutdown, and as defined in 40 CFR 60, Subpart A [District NSR Rule] Federally Enforceable Through Title V Permit
9. VOC emissions, total for gas turbine exhaust and lube oil vents, shall not exceed 0.58 lb./hr, except during periods of startup and shutdown as defined in this permit, and shall not exceed 14.0 lbs/day. [District NSR Rule] Federally Enforceable Through Title V Permit

10. Emission rates from gas turbine exhaust stream shall not exceed the following: PM₁₀: 66.3 lb./day, NO_x (as NO₂): 138.7 lb./day, SO_x (as SO₂): 6.5 lb./day, and CO: 261.6 lb./day. [District NSR Rule] Federally Enforceable Through Title V Permit

11. Emission concentration of nitrogen oxides (as NO₂) at gas turbine exhaust stack shall not exceed 3.6 ppmv dry calculated to 15% O₂, except during periods of startup and shutdown. [District NSR Rule]. Federally Enforceable Through Title V Permit

12. The maximum emission concentration of carbon monoxide (CO) at gas turbine exhaust stack shall not exceed 11 ppmv dry calculated to 15% O₂, except during periods of startup and shutdown. [District NSR Rule] Federally Enforceable Through Title V Permit

13. Total particulate matter (PM) emissions from the turbine exhaust shall not exceed 0.10 gr./dscf [District Rule 4201; Kern County Rule 404] Federally Enforceable Through Title V Permit

14. Circular cross section gas turbine exhaust stack (after SCR unit) shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and equipped with flow straighteners, if necessary, to minimize turbulence. The facility shall comply with this and all applicable compliance testing procedures described in District Rule 1081 (amended December 17, 1992). [District NSR Rule; District Rule 4703; District Rule 1081; Kern County Rule 108.1] Federally Enforceable Through Title V Permit

15. CEM data may be used to determine compliance with emission limits. [District NSR Rule] Federally Enforceable Through Title V Permit

16. Unfired heat recovery steam generator turbine exhaust shall be equipped with continuous emissions monitors (CEM) for NO_x, CO, and O₂. The continuous NO_x monitoring system shall meet the performance specification requirements in 40 CFR 60, Appendix F, 40 CFR 51, Appendix P, and Part 60, Appendix B or shall meet equivalent specifications established by mutual agreement with the District, the ARB, and the EPA [District NSR Rule; District Rule 4703; Rule 1080; Kern County Rule 108; 40 CFR Part 60] Federally Enforceable Through Title V Permit

17. The facility shall comply with the applicable requirements for quality assurance testing and maintenance of the CEM equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F [District Rule 1080, 6.5; 40 CFR Part 60] Federally Enforceable Through Title V Permit

18. CEM results shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA [District Rule 1080, 7.2; Kern County Rule 108] Federally Enforceable Through Title V Permit

19. Except for NO_x and CO emission data obtained for compliance demonstration purposes, CEM data shall be averaged in accordance with the requirements specified under 40 CFR Part 60.13. Compliance results for NO_x and CO shall be averaged over a three hour period. [District Rule 4703, 5.0] Federally Enforceable Through Title V Permit

20. The operator shall maintain on file copies of all natural gas fuel invoices, natural gas bills, gas purchase contracts, supplier certifications, and test results used to determine compliance with the requirements of this permit unit. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

21. Operators of CEMs shall submit a written report for each calendar quarter to the APCO. The report is due on the 30th day following the end of the calendar quarter and shall include: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventative measures adopted; averaging period used for data reporting corresponding to the averaging

period specified in the emission test period used to determine compliance with an emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred. [District Rule 2520, 9.6.1; Rule 1080, 8.0; Kern County Rule 108; 40 CFR 60.7(c)] Federally Enforceable Through Title V Permit

22. The operator shall notify the APCO of a violation of emission standards, as indicated by the CEM, within 96 hours of occurrence. The APCO shall be notified within 8 hours after detection of a breakdown in monitoring equipment and 24 hours prior to a planned shutdown of monitoring equipment. [District Rule 2520, 9.6.2; Rule 1080, 9.0 and 10.0; Kern County Rule 108; 40 CFR 60.334(c)] Federally Enforceable Through Title V Permit

23. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following applicable requirements; SJVUAPCD Rules 1080, sections 4.0, 6.5, 7.2, 7.3, 8.0, 9.0, and 10.0 (amended December 17, 1992); 1081 (amended December 16, 1993); 4201 (amended December 17, 1992); 4801 (amended December 17, 1992); 4703 sections 5.0, 5.1, 5.2, 6.2.1, 6.2.4, 6.3, and 6.4 (amended October 16, 1997); 40 CFR 60.332(a), (b); 60.333(a), (b), (c); 60.335(a), (b), (c), (e); and 40 CFR Part 64. A permit shield is granted for these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

24. The requirements of 40 CFR 72.6(b) (Acid Rain Provisions) do not apply to this source. A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

25. All permits issued to facilities S-172, S-1118, S-1119, S-1120, and S-2049 are included in Destec's heavy oil central stationary source. [District NSR Rule] Federally Enforceable Through Title V Permit

26. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102].

27. Startup and shutdown of the gas turbine, as defined in this permit, in 40 CFR Subpart A 60.2, and in Rule 4703 shall not exceed a time period of two hours and one hour, respectively, per occurrence. Emission concentrations subsequent to this startup period shall not exceed 9.0 ppmv for NO_x and 200 ppmv for CO except during shutdown. [District Rule 4703] Federally Enforceable Through Title V Permit

28. Unfired heat recovery steam generator shall not be designed for supplementary firing. [District NSR Rule] Federally Enforceable Through Title V Permit

29. Turbine lube oil vent shall be equipped with lube oil reservoir demister. [District NSR Rule] Federally Enforceable Through Title V Permit

30. Turbine lube oil reservoir shall be equipped with lube oil reservoir demister. [District NSR Rule] Federally Enforceable Through Title V Permit

31. Generator shall be equipped with lube oil mist eliminator. [District NSR Rule] Federally Enforceable Through Title V Permit

32. Gas turbine engine shall be equipped with continuously recording fuel gas flowmeter. [District NSR Rule] Federally Enforceable Through Title V Permit

33. Gas turbine engine shall not burn more than 10.28 MM scf/day of natural gas. [District NSR Rule] Federally Enforceable Through Title V Permit

34. Gas temperature at SCR catalyst section inlet shall be monitored by operational temperature indicator. [District NSR Rule] Federally Enforceable Through Title V Permit

35. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District NSR Rule] Federally Enforceable Through Title V Permit

36. Ammonia slip shall not exceed 20ppmv and daily compliance with ammonia slip shall be demonstrated by means of the calculation procedure set forth as follows: Ammonia slip shall be calculated as: $\text{slip} = (a - (b \times c / 1,000,000)) \times 1,000,000 / b$, where a = ammonia injection rate (lb/hr)/17(lb/lb.mol), and b= dry exhaust gas flow rate (lb/hr)/29(lb/lb.mol), and c = change in measured NOx concentration ppmv at stack O2. The "daily compliance" requirement can be met with a daily average ammonia slip value, as calculated pursuant to this condition. [District Rule 4102]

37. Inlet gas temperature to catalyst bed shall be maintained within the range recommended by manufacturer except during periods of startup and shutdown as defined in this permit. [District NSR Rule] Federally Enforceable Through Title V Permit

38. All gas turbine engine exhaust shall flow through catalyst bed. [District NSR Rule] Federally Enforceable Through Title V Permit

39. The operator shall keep accurate records of daily fuel consumption of gas turbine engine and shall make records readily available for District inspection upon request.[District NSR Rule] Federally Enforceable Through Title V Permit

40. The facility shall comply with all applicable requirements for compliance monitoring in 40 CFR Part 64. [40 CFR Part 64] Federally Enforceable Through Title V Permit

41. The operator shall monitor and record exhaust gas temperature at oxidation catalyst inlet, and if average temperature exceeds 800 deg. F., shall establish that VOC control satisfies BACT requirement. [District NSR Rule] Federally Enforceable Through Title V Permit

42. Compliance with fuel gas sulfur limit and H2S limit shall be demonstrated by fuel gas sample analysis by independent testing laboratory taken at time of annual stack gas sampling. Official test results and field data collected to comply with this condition and shall be submitted to the District within 60 days of testing. Certification of the sulfur content by the gas supplier is an acceptable alternative for verifying compliance. [District NSR Rule] Federally Enforceable Through Title V Permit

43. On days of turbine engine startup/shutdown, permittee shall demonstrate compliance with NOx and CO daily emissions limits by CEM data, fuel rate data, and daily hours of operation data. A written record of the compliance demonstration shall be maintained. [District NSR Rule] Federally Enforceable Through Title V Permit

44. Any lube/oil accumulating vent having visible emissions with an opacity of 5% of greater shall be tested to demonstrate compliance with VOC emissions limit. Official test results/field data shall be submitted within 60 days of testing. [District NSR Rule] Federally Enforceable Through Title V Permit

45. All CEM data, test results, and operating data required to comply with the conditions in this permit shall be rounded to the same number of significant digits as the specified limits. [40 CFR 60.14(h)] Federally Enforceable Through Title V Permit

46. Records shall be maintained, and shall contain: the occurrence and duration of any startup, shutdown, or malfunction; performance testing, evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, maintenance of any CEM that have been installed pursuant to District Rule 1080; emission measurements, and daily actual local startup and stop time, length and reason for reduced load periods, total hours of operation and quantity of fuel used. [40 CFR 60.332(a), (b); District Rule 4703; Kern County Rule 108] Federally Enforceable Through Title V Permit

47. The concentration of nitrogen oxides (NO_x) from the gas turbine streams shall be determined using EPA Method 7E or 20, and oxygen (O₂) concentration shall be determined using EPA Method 3, 3A, or 20. Carbon monoxide (CO) emissions shall be determined using EPA Test Methods 10 or 10B. Source test results will be provided to the District annually. [District Rule 1081; District Rule 2520, 9.4 and 9.5; District Rule 4703, 5.1 & 6.4; 40 CFR Subpart GG 60.335(b) and (c); 40 CFR Subpart A 60.8] Federally Enforceable Through Title V Permit

48. A written record of the compliance demonstration with NO_x and CO daily emissions limits during gas engine turbine engine startup/shutdown shall be maintained and made available for District inspection for a period of five years. [District NSR Rule; District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

49. Audits of monitors shall be conducted semi-annually in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with the quarterly compliance reports to the District. [District NSR Rule] Federally Enforceable Through Title V Permit

50. Compliance with VOC (hourly) and ammonia slip (ppmv) emission limits shall be demonstrated by District witnessed sample collection by independent testing laboratory annually within 60 days prior to permit anniversary date. [District NSR Rule] Federally Enforceable Through Title V Permit

51. The District must be notified 30 days prior to any compliance source test, and a source plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081, 7.0; Kern County Rule 108.1] Federally Enforceable Through Title V Permit